

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 27866/37713	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US2004/008459	International filing date (day/month/year) 19/03/2004	(Earliest) Priority Date (day/month/year) 24/03/2003
Applicant ICOS CORPORATION		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 7 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box II).

3. ☐ **Unity of invention is lacking** (see Box III).

4. With regard to the title,

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

XANTHONES, THIOXANTHONES AND ACRIDINONES AS DNA-PK INHIBITORS

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regards to the drawings,

- a. the figure of the **drawings** to be published with the abstract is Figure No. _____

☐ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

- b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US2004/008459

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07D311/86 C07D405/04 C07D219/06 C07D219/16 C07D401/06
 C07F9/655 C07F9/64 C07D405/12 C07D471/04 A61K31/35
 A61P35/00 //(C07D471/04, 221:00, 221:00)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07D C07F A61K A61P

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, BEILSTEIN Data, EMBASE, BIOSIS, CHEM ABS Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02/20500 A (ICOS CORP) 14 March 2002 (2002-03-14)	1-8, 11-21, 23-45
A	claim 1	9, 10, 22
X	ABADI ASHRAF H ET AL: "Synthesis, antitumor and antitubercular evaluation of certain new xanthenone and acridinone analogues" ARZNEIMITTEL-FORSCHUNG, vol. 49, no. 3, March 1999 (1999-03), pages 259-266, XP002296342 ISSN: 0004-4172 page 263	1-8, 11-19, 23-45

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *Z* document member of the same patent family

Date of the actual completion of the international search

15 September 2004

Date of mailing of the international search report

11/10/2004

Name and mailing address of the ISA

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 92/16517 A (XENOVA LTD) 1 October 1992 (1992-10-01) claim 1	1-8, 11-19, 23-45
X	MARI STEFANIA ET AL: "Flavone and xanthone derivatives related to fluoroquinolones" FARMACO (LAUSANNE), vol. 54, no. 6, 30 June 1999 (1999-06-30), pages 411-415, XP002296343 ISSN: 0014-827X page 412 -page 413	1-8, 11-19,23
X	DE 31 41 970 A (VNII LEKARSTVENNYCH RASTENIJ V) 5 May 1983 (1983-05-05) claim 1	1-8, 11-19,23
X	WO 96/16632 A (ROBIN JEAN RENAUD ; ROCHER YVES BIOLOG VEGETALE (FR); ROUILLARD FRANCO) 6 June 1996 (1996-06-06) claim 1	1-8, 11-19,23
X	DATABASE CAPLUS 'Online! STN; 1989 KLOPMAN ET AL.: "An artificial intelligence approach..." Database accession no. 1989:150323 XP002296348 see TRN: 119427-89-3, 119427-90-6 abstract & MOLECULAR PHARMACOLOGY, vol. 34, no. 6, 1988, pages 852-862,	1-8, 11-19,23
X	WO 01/17985 A (VALENTI PIERO ; INDENA SPA (IT); BOMBARDELLI EZIO (IT)) 15 March 2001 (2001-03-15) claim 1	11-19, 23-45
X	US 2001/027210 A1 (WILSON WILLIAM R) 4 October 2001 (2001-10-04) column 1	11-19, 23-45
X	GHOSH CHANDRA KANTA ET AL: "Benzopyrans: Part 30. Synthesis of substituted xanthenes from 3-acyl-2-methylbenzopyran-4-ones" TETRAHEDRON, vol. 49, no. 19, 1993, pages 4127-4134, XP002296344 ISSN: 0040-4020 page 4128	1-9

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE CAPLUS 'Online! STN; 2002 XUAN ET AL.: "Two new O and C-glycosylxanthenes..." Database accession no. 2002:80848 XP002296349 see RN: 400759-79-7 abstract & GAODEN XUEXIAO HUAXUE XUEBAO, vol. 22, no. 10, supp., 2001, pages 148-150,</p> <p>---</p>	1-9
X	<p>FONTENEAU NADIA ET AL: "Synthesis of quinone and xanthone analogs of rhein" TETRAHEDRON, vol. 57, no. 44, 29 October 2001 (2001-10-29), pages 9131-9135, XP002296345 ISSN: 0040-4020 page 9133</p> <p>---</p>	1-9
X	<p>DATABASE CAPLUS 'Online! STN; 1973 AGASIMUNDIN ET AL.: "Furano compounds..." Database accession no. 1973:124471 XP002296350 see RN: 41534-30-9 abstract & JOURNAL FUER PRAKTISCHE CHEMIE, vol. 314, no. 3-4, 1972, pages 507-514,</p> <p>---</p>	11-21
X	<p>DATABASE CAPLUS 'Online! STN; 1969 GOUD ET AL.: "Furan compounds. XVI" Database accession no. 1969:96661 XP002296351 see RN: 22315-95-3 abstract & MONATSH. CHEM., vol. 100, no. 1, 1969, pages 38-41,</p> <p>---</p>	11-21
X	<p>EP 0 471 516 A (ICI PLC) 19 February 1992 (1992-02-19)</p> <p>claim 1</p> <p>---</p>	1-8, 11-19, 23-45
X	<p>WO 90/14008 A (SLOAN KETTERING INST CANCER) 29 November 1990 (1990-11-29) claim 1</p> <p>---</p> <p>--- -/--</p>	11-19, 23-45

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 12, 29 October 1999 (1999-10-29) -& JP 11 199565 A (TOYAMA CHEM CO LTD), 27 July 1999 (1999-07-27) abstract	1-8, 11-19,23
X	--- TABARRINI ORIANA ET AL: "Design and synthesis of modified quinolones as antitumoral acridones" JOURNAL OF MEDICINAL CHEMISTRY, vol. 42, no. 12, 17 June 1999 (1999-06-17), pages 2136-2144, XP002296346 ISSN: 0022-2623 page 2139; table 1	1-8, 11-19, 23-45
X	--- FUJIOKA H ET AL: "Activities of new acridone alkaloid derivatives against Plasmodium yoelii in vitro" ARZNEIMITTEL-FORSCHUNG/DRUG RESEARCH 1990 GERMANY, vol. 40, no. 9, 1990, pages 1026-1029, XP002296347 ISSN: 0004-4172 page 1027; table 1	1-8, 11-19,23
X	--- US 4 539 412 A (ARCHER SYDNEY) 3 September 1985 (1985-09-03) claim 1	11-21, 23-45
X	--- CROISY-DELCEY ET AL.: "AZA ANALOGUES OF LUCANTHONE: SYNTHESIS AND ANTITUMOR AND BACTERICIDAL PROPERTIES" 1 September 1983 (1983-09-01) , JOURNAL OF MEDICINAL CHEMISTRY, AMERICAN CHEMICAL SOCIETY. WASHINGTON, US, PAGE(S) 1329-1333 XP000561937 ISSN: 0022-2623 page 1330 -page 1331	11-21, 23-45
X	--- US 3 904 631 A (ELSLAGER EDWARD F ET AL) 9 September 1975 (1975-09-09) claim 1 --- -/--	1-8, 11-19,23

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>HARFENIST M ET AL: "SELECTIVE INHIBITORS OF MONOAMINE OXIDASE. 3. STRUCTURE-ACTIVITY RELATIONSHIP OF TRICYCLICS BEARING IMIDAZOLINE, OXADIAZOLE, OR TETRAZOLE GROUPS" JOURNAL OF MEDICINAL CHEMISTRY, AMERICAN CHEMICAL SOCIETY. WASHINGTON, US, vol. 39, no. 9, 1996, pages 1857-1863, XP001097214 ISSN: 0022-2623 the whole document -----</p>	<p>1,3-8, 11-19,23</p>

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Information on patent family members

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